

# What's a better persistence forecast

Percent exceedence vs  
Percent of average

DWR Snow Conference  
Fallen Leaf Lake, CA  
Oct 2009



# Definitions first...

- A ranking is a list of values in ascending order
- Percent Exceedence is related to the location of a value on a ranked list

## Perfect River flow data (7 year record):

Value (taf)	Count	Exceedence
7	1	99
12	2	85
17	3	71
23	4	57
29	5	43
34	6	29
39	7	15
45	8	1

## Example:

### Predicting June's FNF based on May's statistics

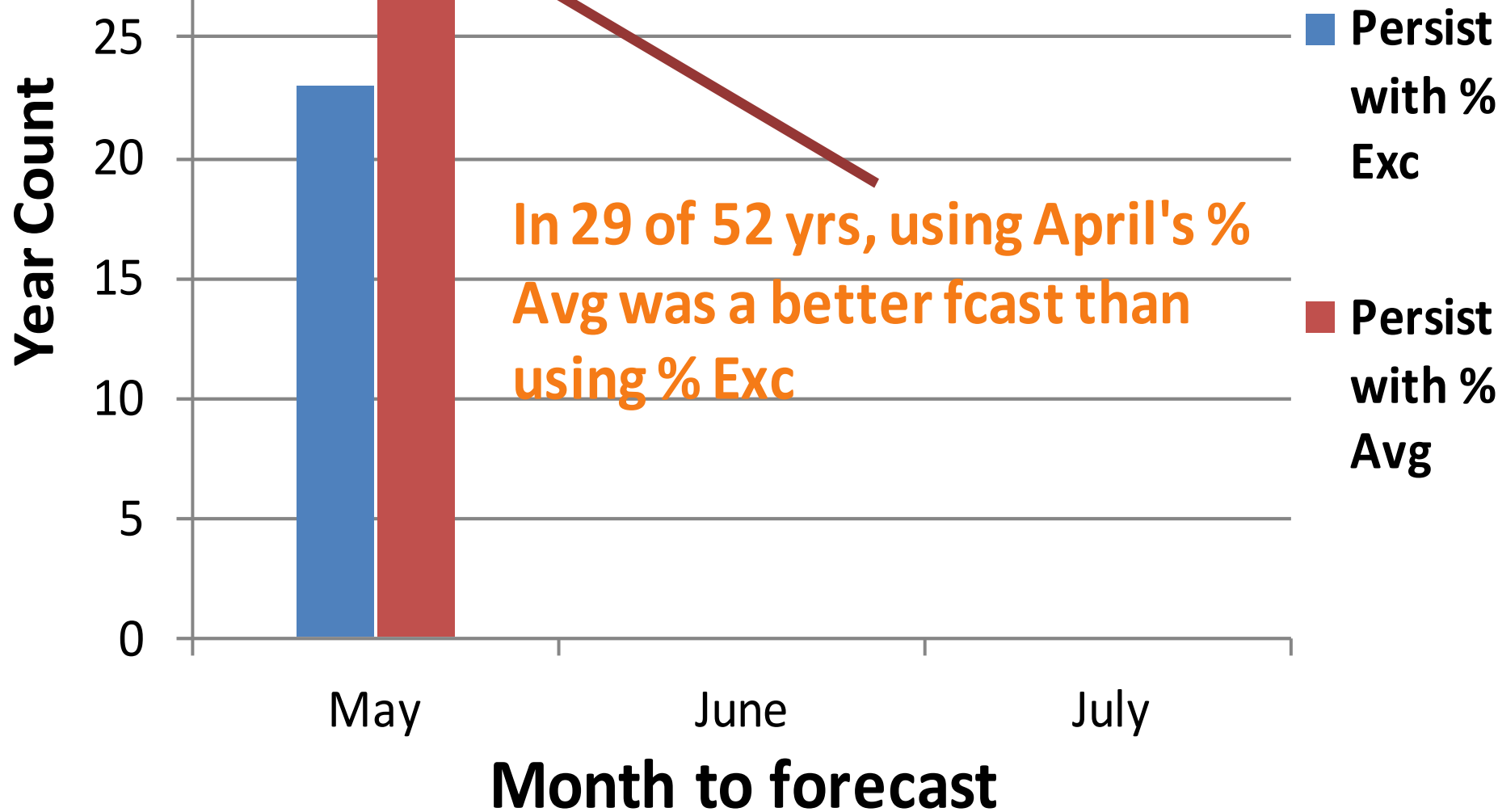
<u>May Observed FNF (taf)</u>		<u>Jun (avg = 392) FNF (taf) forecasted with persistence</u>
300	% avg = 68	using May's % avg... 267 taf
300	% exc = 75	using May's % exc... 190 taf

# Kings River monthly FNF with percent average and percent exceedence

WY	Apr	% avg	%exc	May	% avg	%exc
1973	208	97	49	748	170	5
1974	233	109	40	618	141	18
1975	97	45	95	522	119	33
1976	74	35	97	159	36	95
1977	71	33	99	83	19	99
1978	276	129	22	688	157	11
1979	214	100	46	599	137	22

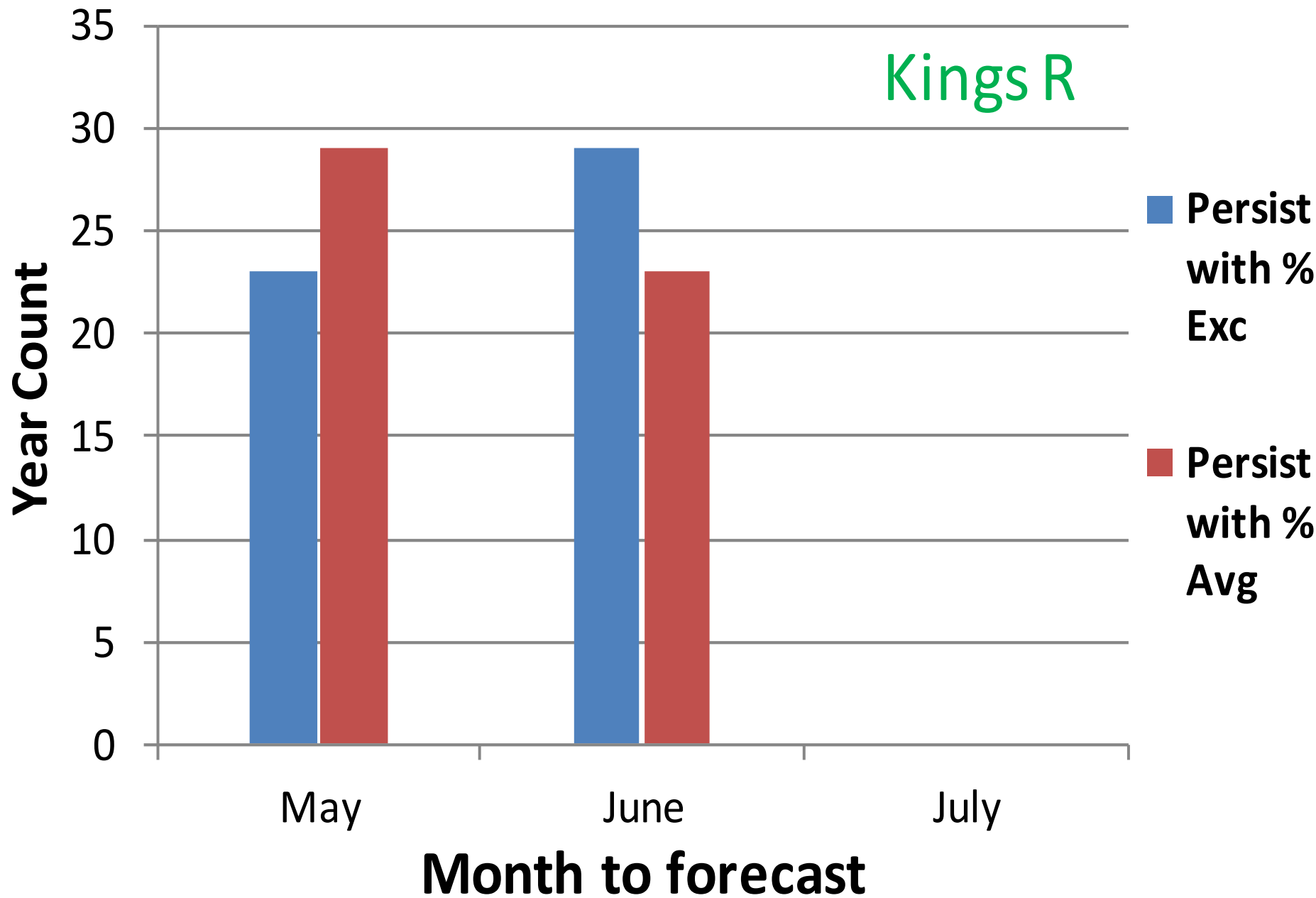
## Comparison of % Exc vs % Avg as Persistence Tool

Kings R



# Comparison of % Exc vs % Avg as Persistence Tool

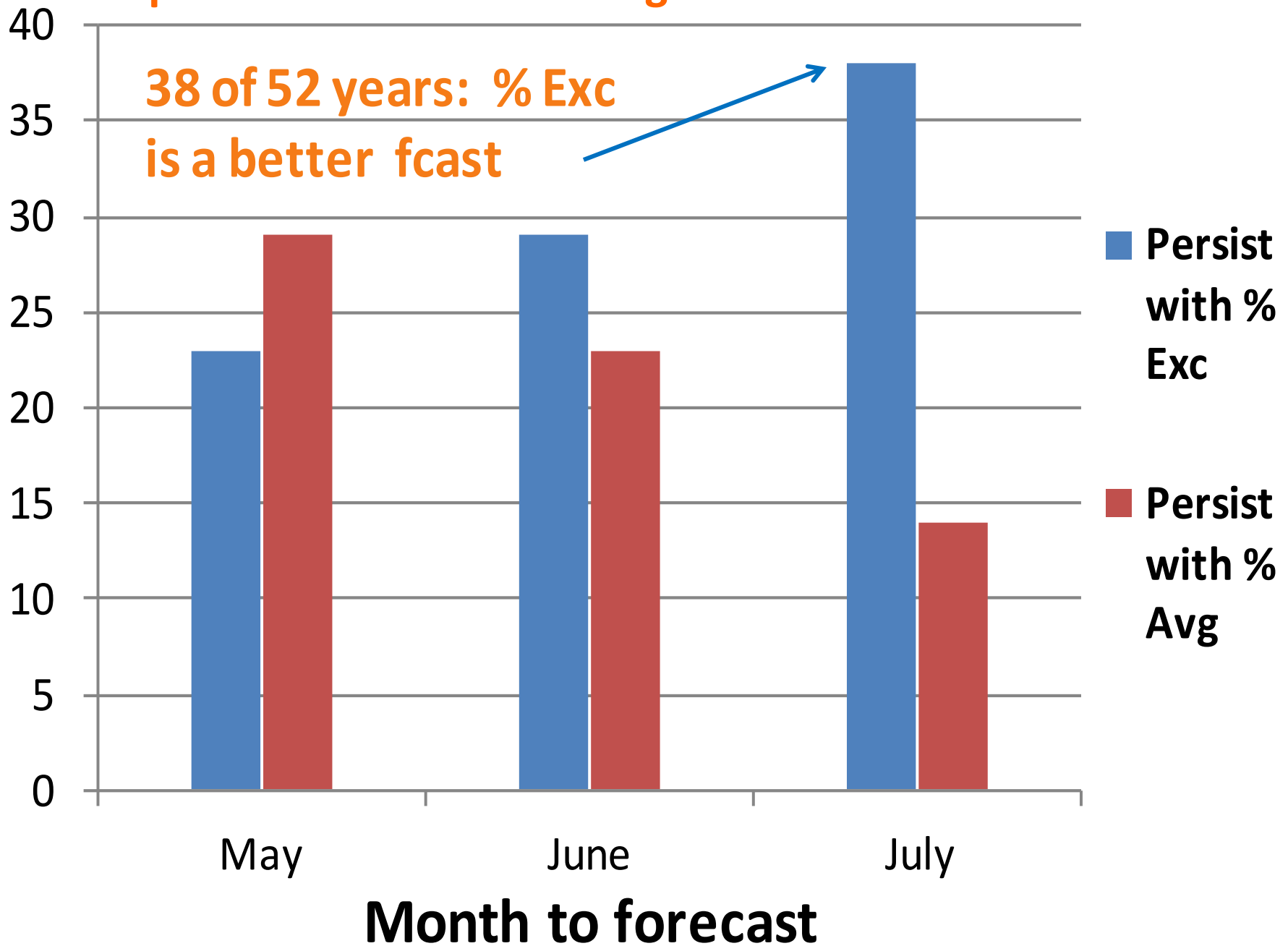
Kings R



## Comparison of % Exc vs % Avg as Persistence Tool

38 of 52 years: % Exc  
is a better fcast

Year Count





# Checking a May 1 forecast using new tool:

Persisting with previous month's statistics

	Persisting with...		
	Proposed Fcast	% Exc	% Avg
April Observed	170		
May fcast	320	330	345
June fcast	250	210	245
July fcast	100	80	195

The previous four slides  
persisted statistics from one  
month to the next



Why does % Exceedence  
become a better forecast as the  
AJ period progresses?



The % average is affected by a few extreme years





Consider Dry ( $< 90\%$  Avg) May  
conditions and June and July %  
average



# Since 1956 (Kings):

- 23 of 52 yrs, May < 90% average RO
- In 18 of those 23 yrs:  
June % avg < May  
July % avg < June
- In 5 of those 23 yrs:  
June % exc < May  
July % exc < June

# Conclusions:

- Persisting with % Exc and % Avg can produce significantly different results
- Persisting with % Avg is a better forecast than with % Exc when forecasting May
- After May, persisting with % Exc produces an increasingly more accurate forecast than using % Avg